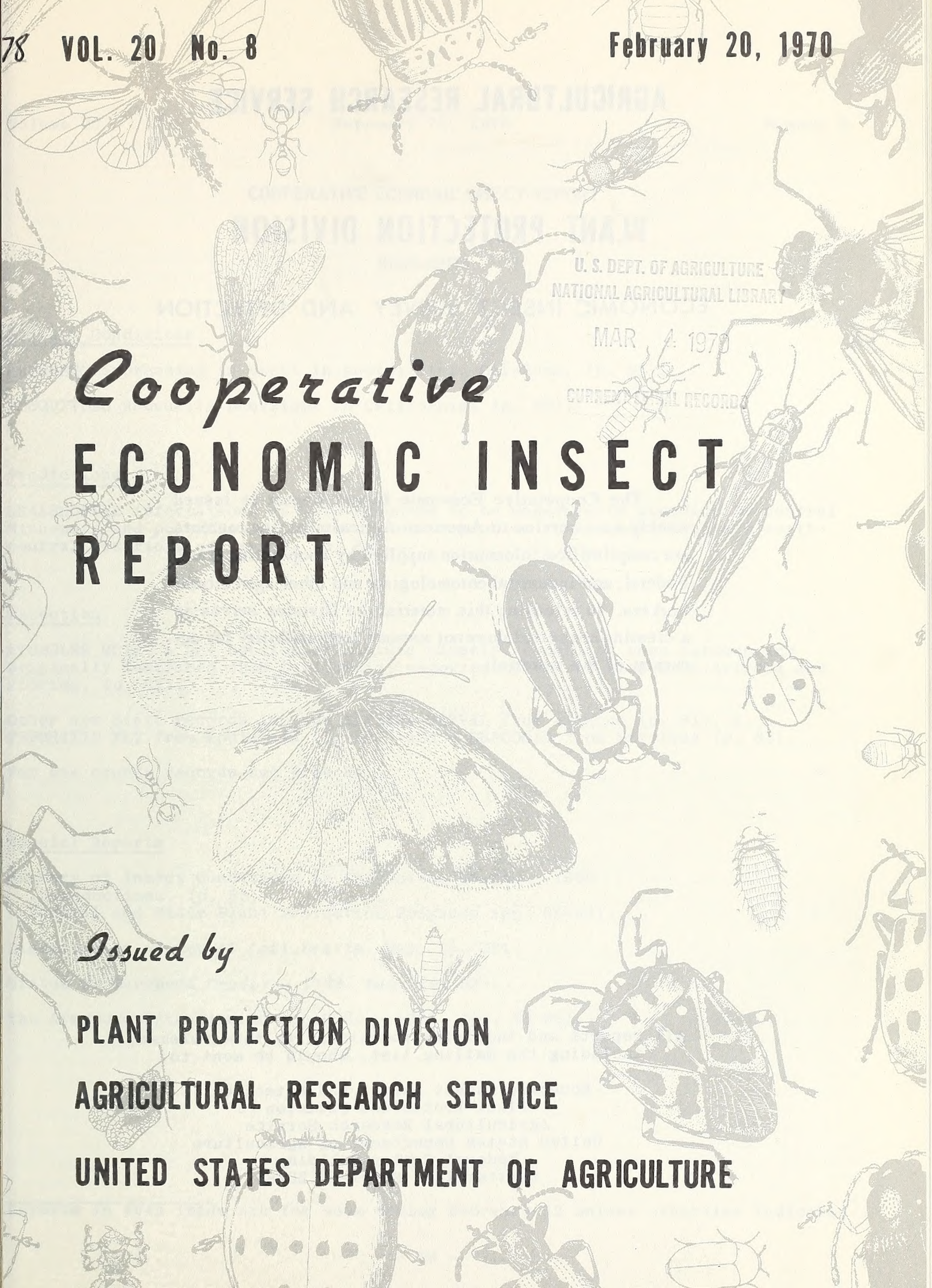
Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

78

VOL. 20 No. 8 February 20, 1970



U. S. DEPT. OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY
MAR 4 1970
CURRENT SERIAL RECORDS

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PROTECTION DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PROTECTION DIVISION

ECONOMIC INSECT SURVEY AND DETECTION

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

All reports and inquiries pertaining to this release, including the mailing list, should be sent to:

Economic Insect Survey and Detection
Plant Protection Division
Agricultural Research Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782

Volume 20 February 20, 1970 Number 8

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG increasing in wheat in southwestern Oklahoma. (p. 81).

MOSQUITOES unusually prevalent in California. (p. 83).

Predictions

GRASSHOPPER infestations in 1970 expected to be moderate to abundant in central Minnesota and potentially the most serious problem in the northeast and north-central districts of Kansas. (p. 89).

Detection

STOMBLER MOTH, a new species of noctuid closely resembling corn earworm and originally described from California, reported for first time from Arizona and Florida. (p. 81).

Other new State records include ALFALFA WEEVIL from Arizona (p. 81), a TEPHRITID FLY from Louisiana (p. 82), and a BRACONID from Maryland (p. 83).

For new county records see page 84.

Special Reports

Summary of Insect Conditions in the United States - 1969
  Introductions. (p. 85).
  Federal and State Plant Protection Programs.(pp. 85-94).

Distribution of Cereal Leaf Beetle. Map. (p. 86).

Status of European Chafer - 1969. Map. (p. 88).

The Armyworm Situation in the U.S. - 1969. (pp. 95-98).

Reports in this issue are for week ending February 13 unless otherwise indicated.

CONTENTS

Special Insects of Regional Significance....81

Insects Affecting

Corn, Sorghum, Sugarcane....81
Small Grains....81
Turf, Pastures, Rangeland....81
Forage Legumes....81
General Vegetables....82
Citrus....82
Ornamentals....82
Man and Animals....83
Households and Structures....83

Beneficial Insects....83
Federal and State Plant Protection Programs....83
Hawaii Insect Report....84
Detection....84
Light Trap Collections....84
Summary of Insect Conditions in the United States - 1969
  Introduction....85
  Federal and State Plant Protection Programs....85
Distribution of Cereal Leaf Beetle. Map....86
Status of European Chafer - 1969. Map....88
The Armyworm Situation in the U.S. - 1969....95

WEATHER BUREAU'S 30-DAY OUTLOOK

MID-FEBRUARY TO MID-MARCH 1970

The Weather Bureau's 30-day outlook for mid-February to mid-March is for temperatures to average above seasonal normals over the western half of the Nation. Below normal temperatures are indicated for the Great Lakes region and the Southeast while near normal values are expected in unspecified areas. Precipitation is expected to exceed normal in the Pacific Northwest, the Great Lakes region, and the Southeast. Subnormal totals are indicated from the southern Plateau through the southern Plains. Elsewhere near normal precipitation is in prospect.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D.C. 20250. Price $5.00 a year.

WEATHER OF THE WEEK ENDING FEBRUARY 16

HIGHLIGHTS: Mild temperatures continued in the West while stormy cold weather predominated in the East.

PRECIPITATION: Light rain fell along the Pacific coast but mostly sunny weather prevailed on most days elsewhere over the West. Stormy weather brought snow to much of the northeastern quarter of the Nation. Sometimes, the snow fell mixed with sleet and freezing rain. The heaviest snow of the season hit parts of the southern Appalachians, accumulating to 20 inches at Halston Mountain, about 15 miles east of Bristol, Tennessee, by midforenoon Tuesday. By 7 a.m. Wednesday, snow in western and central Pennsylvania had accumulated to 10 to 18 inches. Mount Washington, New Hampshire, received 10.12 inches of precipitation in 18 hours ending at 6 a.m. Wednesday. The gusts at Mount Washington reached 123 m.p.h. and 1 foot of ice accumulated in 3 hours. The weekend brought more miserable weather to much of the East--mixtures of snow, sleet, and freezing rain. On Saturday, highway travel became hazardous over a dozen States from Missouri and Arkansas across the Ohio River Valley to the middle Atlantic coast. The light precipitation in the central Great Plains improved the topsoil moisture but more rain was needed to prevent wind erosion. Weather of the week continued on page 94.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

BEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Variable rainfall throughout overwintering areas caused uneven concentrations from Los Banos Hills southward through Kings County. Winter control efforts may be suspended until spring nymphs emerge. Beet leafhoppers are scattered on flats in every area except in northern Los Banos Hills. (Cal. Coop. Rpt.).

GREENBUG (Schizaphis graminum) - CALIFORNIA - Medium and damaging 80 acres of barley at Holtville, Imperial County. (Cal. Coop. Rpt.). ARIZONA - Spotted and heavy in one treated wheatfield at Yuma, Yuma County. (Ariz. Coop. Sur.). NEW MEXICO - Ranged 0-10 per linear foot on wheat in Curry County. (Campbell). Ranged 0-3 per linear foot on barley in Chaves County. (Mathews). OKLAHOMA - Increasing in wheat in southwestern quarter of State. Counts per linear foot: 100-200 in several fields in Jackson, Cotton, and Tillman Counties; 50-100 in Grady County; 75 in Stephens County; and 0-10 in Jefferson County. Still light in Payne County, ranged less than 1 to 25 per linear foot. Light in Garvin County. (Okla. Coop. Sur.). KANSAS - Ranged 1-5 per linear foot in wheat in Wabaunsee County. Survey negative in Riley and Geary Counties. (Redding).

CORN, SORGHUM, SUGARCANE

STOMBLER MOTH (Heliothis stombleri Okumura and Bauer*) - CALIFORNIA - The holotype and the allotype of this new species of noctuid, resembling H. zea (corn earworm), were described from specimens collected in Davis and Yolo, Yolo County, in September 1969 by W.H. Lange, Jr., and V. Stombler, respectively. Specimens have also been collected in Colusa, Fresno, Kern, Merced, Monterey, Riverside, Sacramento, San Bernardino, San Diego, San Joaquin, and San Mateo Counties. Additional light trap records include Maricopa County, Arizona; Alachua County, Florida; Boone County, Missouri; Grant and Yakima Counties, Washington; and the State of Sinaloa, Mexico. Critical study of H. stombleri and H. zea revealed no definite external character to differentiate the two species, except for the rounded emargination on the eighth sternite in the female. Males apparently can be distinguished only by examining the genitalia. (Okumura, Bauer). Arizona and Florida are new State records. (PPD).

SMALL GRAINS

ENGLISH GRAIN APHID (Macrosiphum avenae) - OKLAHOMA - First of season, 2 females, collected in wheatfields near Stillwater, Payne County. (Okla. Coop. Sur.).

TURF, PASTURES, RANGELAND

A MARCH FLY (Dilophus orbatus) - CALIFORNIA - Larval infestations more numerous than usual in lawns and soil at Manteca, San Joaquin County. (Cal. Coop. Rpt.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - ARIZONA - Adults collected from alfalfa at Colorado City, Mohave County, by J. May on September 16, 1969. Determined by R.E. Warner. This is a new State record. (Ariz. Coop. Sur.).

PEA APHID (Acyrthosiphon pisum) - NEW MEXICO - Ranged up to 5 per square foot on most alfalfa near Roswell, Chaves County; counts 22 per square foot in one field. (Mathews).

---

*Okumura, G.T., and Bauer, W.R. 1969. Cal. Dept. Agr. Bur. Ent. Occasional Papers No. 18, pp. 8.

GENERAL VEGETABLES

CABBAGE LOOPER (*Trichoplusia ni*) - ARIZONA - Larval emergence light in some lettuce fields at Yuma, Yuma County. (Ariz. Coop. Sur.).

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Several lettuce fields treated at Yuma, Yuma County. (Ariz. Coop. Sur.).

BULB MITE (*Rhizoglyphus echinopus*) - CALIFORNIA - Heavy on onion seedlings at Shafter, Kern County. (Cal. Coop. Rpt.).

CITRUS

Citrus Insect Situation in Florida - End of January 1970 - CITRUS RUST MITE (*Phyllocoptruta oleivora*) infested 78 (norm 63) percent of groves; economic in 47 (norm 46) percent. Populations decreased throughout month but still slightly above normal and in high range in most districts. Increase expected. Highest districts west, central, east, and north. CITRUS RED MITE (*Panonychus citri*) infested 41 (norm 36) percent of groves; economic in 15 (norm 12) percent. Population slightly above normal for month but in low range. Little change expected. Only few scattered infestations will be important. Highest districts west and north. TEXAS CITRUS MITE (*Eutetranychus banksi*) infested 27 (norm 33) percent of groves; economic in 9 (norm 12) percent. Below normal; will remain low. Highest district west. SIX-SPOTTED MITE (*Eotetranychus maculatus*) in 2 percent of groves; none economic. Not expected to become important until April. GLOVER SCALE (*Lepidosaphes gloverii*) infested 79 (norm 78) percent of groves; economic in 5 (norm 15) percent. Moderate and near normal statewide, but infestations generally lighter. Little change expected. Highest districts east, west, and north. PURPLE SCALE (*L. beckii*) infested 71 (norm 77) percent of groves; economic in 6 (norm 8) percent. Slightly below normal and in moderate range with very few heavy infestations. Little change expected. Highest districts north and west. CHAFF SCALE (*Parlatoria pergandii*) infested 43 (norm 59) percent of groves; economic in 1 (norm 10) percent. Below normal and in low range. No change expected. All districts low. BLACK SCALE (*Saissetia oleae*) infested 27 (norm 37) percent of groves; economic in 6 (norm 17) percent. Cold weather reduced population below normal and at very low level, except in warmer districts. Highest district east. YELLOW SCALE (*Aonidiella citrina*) infested 64 (norm 60) percent of groves; economic in 9 (norm 12) percent. Population near normal and at moderate level. Slight decrease expected. District populations range from north and east to west. An ARMORED SCALE (*Unaspis citri*) infested 25 (7 moderate to heavy) percent of groves. Highest on record for January. Expected to increase. WHITEFLIES above normal, expected to continue at current moderate level. (W.A. Simanton (Citrus Expt. Sta., Lake Alfred)).

A TEPHRITID FLY (*Tephritis subpura*) - LOUISIANA - Adult collected in citrus nursery at Port Sulphur, Plaquemines Parish, February 2, 1970, by T. Mayeux and W. Harris. Determined by G. Steyskal. This is a new State record. Previously recorded from New Jersey, Virginia, and Florida. Hosts include *Xanthium echinatum*, galactia, myrtle, mango, and guava. (PPD).

ORNAMENTALS

WHITE PEACH SCALE (*Pseudaulacaspis pentagona*) - OREGON - Small infestations found on Akebono cherry at several residences in Portland, Multnomah County, February 11. (Larson). VIRGINIA - Severe on peach and lilac in Arlington County. (Allen).

STRAWBERRY ROOT WEEVIL (*Brachyrhinus ovatus*) - OREGON - Damage on arborvitae noted February 3 in field nursery at Portland, Multnomah County. About 1 percent of twigs girdled. Similar girdling also noted at Salem, Marion County. (Larson).

MAN AND ANIMALS

SCREW-WORM (*Cochliomyia hominivorax*) - No cases reported in U.S. February 8-14. Total of 51 laboratory-confirmed cases reported in portion of Barrier Zone in Republic of Mexico February 1-7 as follows: Sonora 36, Chihuahua 9, Coahuila 1, Tamaulipas 5. Total of 10 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released: Texas 168,000; Mexico 89,770,000. (Anim. Health Div.).

COMMON CATTLE GRUB (*Hypoderma lineatum*) - OKLAHOMA - Numbers in backs declining in Payne County. Averaged 3 per head in cattle (ranged 0-5 in yearlings and 0-11 in mature cows). Ranged 5-10 per head in 55 heifers in Mill Creek area of Johnston County and 0-10 per head in cattle in Garvin County. Moderate in Mayes County cattle and light in Hughes County. (Okla. Coop. Sur.). MISSOURI - Ranged 0-28 (averaged 2) per cow on 78 untreated cattle in central area. (Ronald).

MOSQUITOES - CALIFORNIA - Unusually prevalent and irritating to homeowners. Due to excessive rains and unseasonably warm weather, hibernating females emerging in large numbers. Little egg laying to date. (Cal. Coop. Rpt.).

CATTLE LICE - MISSOURI - *Bovicola bovis* (cattle biting louse) light on 2 cows in herd of 67 in central area. (Ronald). OKLAHOMA - Lice, mainly *Haematopinus eurysternus* (short-nosed cattle louse) moderate on cattle in Mayes, Hughes, and Garvin Counties; light in Cleveland County. (Okla. Coop. Sur.). ALABAMA - Unspecified species increasing on cattle in Lee, Bibb, and other counties. Several herds recently treated in Bibb County. (Odom, Teague).

HOG LOUSE (*Haematopinus suis*) - OKLAHOMA - Moderate on hogs in Garvin County. Light in Mayes County. (Okla. Coop. Sur.).

HARD-BACKED TICKS - OKLAHOMA - One replete and 3 unfed females of *Dermacentor variabilis* (American dog tick) found on dogs near Altus, Jackson County. (Okla. Coop. Sur.). MARYLAND - *Rhipicephalus sanguineus* (brown dog tick) heavy in 2 homes in Prince Georges County. (U. Md., Ent. Dept.).

BROWN RECLUSE SPIDER (*Loxosceles reclusa*) - TENNESSEE - Specimen collected in Marion County February 2. This is a new county record. (Mullett).

HOUSEHOLDS AND STRUCTURES

EASTERN SUBTERRANEAN TERMITE (*Reticulitermes flavipes*) - MARYLAND - First swarm of season found in College Park, Prince Georges County. (U. Md., Ent. Dept.).

BENEFICIAL INSECTS

A BRACONID (*Microctonus aethiops*) - MARYLAND - One male and one female of this parasite of *Hypera postica* (alfalfa weevil) emerged from cocoons February 17, 1970. *H. postica* adults collected November 7, 1969, in field at Thurmont, Frederick County, and caged at Beltsville. *M. aethiops* determined by R. Schroeder. This is a new State record and first recovery since release in State in 1969 and earlier. (Schroeder).

CONVERGENT LADY BEETLE (*Hippodamia convergens*) - OKLAHOMA - Light in wheatfields in Jefferson, Tillman, and Payne Counties. (Okla. Coop. Sur.).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - NORTH CAROLINA - Workers collected at Kuhns, Jones County, January 28 by W. Federonko. Determined by V.H. Owens, confirmed by D.R. Smith. This is a new county record. (PPD).

MEXICAN FRUIT FLY (*Anastrepha ludens*) - MEXICO - First sexually mature male trapped at La Paz, Territorio sur de Baja California, February 3. Numerous *Anastrepha spatulata* also trapped. (PPD).

WHITE GARDEN SNAIL (*Theba pisana*) - CALIFORNIA - Second seasonal baiting at Manhattan Beach, Los Angeles County, 66 percent complete. Survey negative for live snails. (Cal. Coop. Rpt.).

WOOLLY WHITEFLY (*Aleurothrixus floccosus*) - CALIFORNIA - Hosts that received first treatment 14 days ago inspected; 94 percent mortality of *A. floccosus* noted. Mortality 97.8 percent on hosts treated second time 2 months ago. (Cal Coop. Rpt.).

HAWAII INSECT REPORT

General Vegetables - Larvae and eggs of CABBAGE LOOPER (*Trichoplusia ni*), IMPORTED CABBAGEWORM (*Pieris rapae*), and DIAMONDBACK MOTH (*Plutella xylostella*) trace in one acre of head cabbage at Pulehu and in 3 acres at Omapio, Maui. (Miyahira). Adults and egg clusters of a PLATASPID BUG (*Coptosoma xanthogramma*) abundant on snap beans at Kilauea, Kauai; 10 percent of eggs parasitized by *Trissolcus* sp. (a scelionid wasp). Adults moderate in 30 acres of surrounding shrubs and trees. (Sugawa). Adults of LEAF MINER FLIES (*Liriomyza* spp.) heavy in one acre of snap beans at Pulehu and Omapio, Mauai; leaf mines trace to light. All stages of GREENHOUSE WHITEFLY (*Trialeurodes vaporariorum*) light in same area. (Miyahira). A PIT SCALE (*Asterolecanium pustulans*) heavy on 100 feet of oleander hedge at Lihue Airport, Kauai; caused severe pitting and dieback. (Sugawa).

Man and Animals - MOSQUITOES - Total collected from 52 light traps on Oahu during January: VEXANS MOSQUITO (*Aedes vexans nocturnus*) 232 and SOUTHERN HOUSE MOSQUITO (*Culex pipiens quinquefasciatus*) 1,888. *Aedes* ranged zero to high of 45 per trap at Punaluu. *Culex* ranged zero to high of 365 at Sunset Beach. (Mosq. Control. Br., Dept. Health).

Miscellaneous Insects - Adults of KOA HAOLE LOOPER (*Anacamptodes fragilaria*) heavy and causing annoyance to residents in Waimea Heights, Kauai; larvae moderate on koa-haole (*Leucaena glauca*) in adjoining wasteland. (Sugawa). An adult male VAGRANT GRASSHOPPER (*Schistocerca vaga*) collected in wild vegetation at Keawakapu, Maui, is second specimen taken on this island. (Ah Sam).

Beneficial Insects - Adults and larvae of LANTANA DEFOLIATOR CATERPILLAR (*Hypena strigata*) heavy on lantana (*Lantana camara*) in several hundred acres of wasteland at Mana, Kauai; severe defoliation noted in many areas. (Sugawa).

DETECTION

New State Records - ALFALFA WEEVIL (*Hypera postica*) ARIZONA - Mohave County. (p. 81). A BRACONID (*Microctonus aethiops*) MARYLAND - Frederick County (p. 83). STOMBLER MOTH (*Heliothis stombleri*) ARIZONA - Marciopa County, FLORIDA - Alachua County (p. 81). A TEPHRITID FLY (*Tephritis subpura*) LOUISIANA - Plaquemines Parish (p. 82).

New County Records - BROWN RECLUSE SPIDER (*Loxosceles reclusa*) TENNESSEE - Marion (p. 83). IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) NORTH CAROLINA - Jones (p. 83).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 2/6-12, BL - Black cutworm (*Agrotis ipsilon*) 3, granulate cutworm (*Feltia subterranea*) 1.

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1969

INTRODUCTION

The summary of insect conditions, beginning in this issue, will be continued in several succeeding issues of the Cooperative Economic Insect Report. This summary was compiled by the Economic Insect Survey and Detection Staff from annual summaries submitted by various State and Federal cooperators. A list of the individuals who assisted in assembling data, as well as a summary of the weather for 1969, will appear after the last section of this summary is published. The Economic Insect Survey and Detection Staff appreciates the assistance of all individuals who have participated in the preparation of material for the 1969 summary.

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

BOLL WEEVIL (Anthonomus grandis) pheromone traps were operated in the High Plains control zone of TEXAS to reduce populations. Weevils were trapped during January, February, April, May, June, and July. By July 24, when trapping was terminated, 12,000+ weevils had been taken. Control on the High Plains was begun on September 2 and continued through November 1, 1969.

All areas of Kent and Dickens Counties in the control zone were declared generally infested during August. Heavy boll weevil populations noted in the Rolling Plains during July decreased considerably. Numerous fields were found infested in the Turkey area and on the Caprock in Briscoe, Floyd, Crosby, and Garza Counties. More infested fields had been found by the end of August than for the corresponding period in past years. Several fields were found infested in Lubbock County. This is the first occurrence of boll weevil in Lubbock County since 1965. Weevils were detected in fields adjacent to the Caprock in Lynn, Borden, and Dawson Counties. Some fields in Dawson County had square infestations up to 55 percent. Installation of a trap line running from the Red River in Hall County south to U.S. Highway 82 in Dickens County was completed. Traps were placed every 0.5 mile along the eastern side of the control zone to determine if weevil movement into the control zone could be detected.

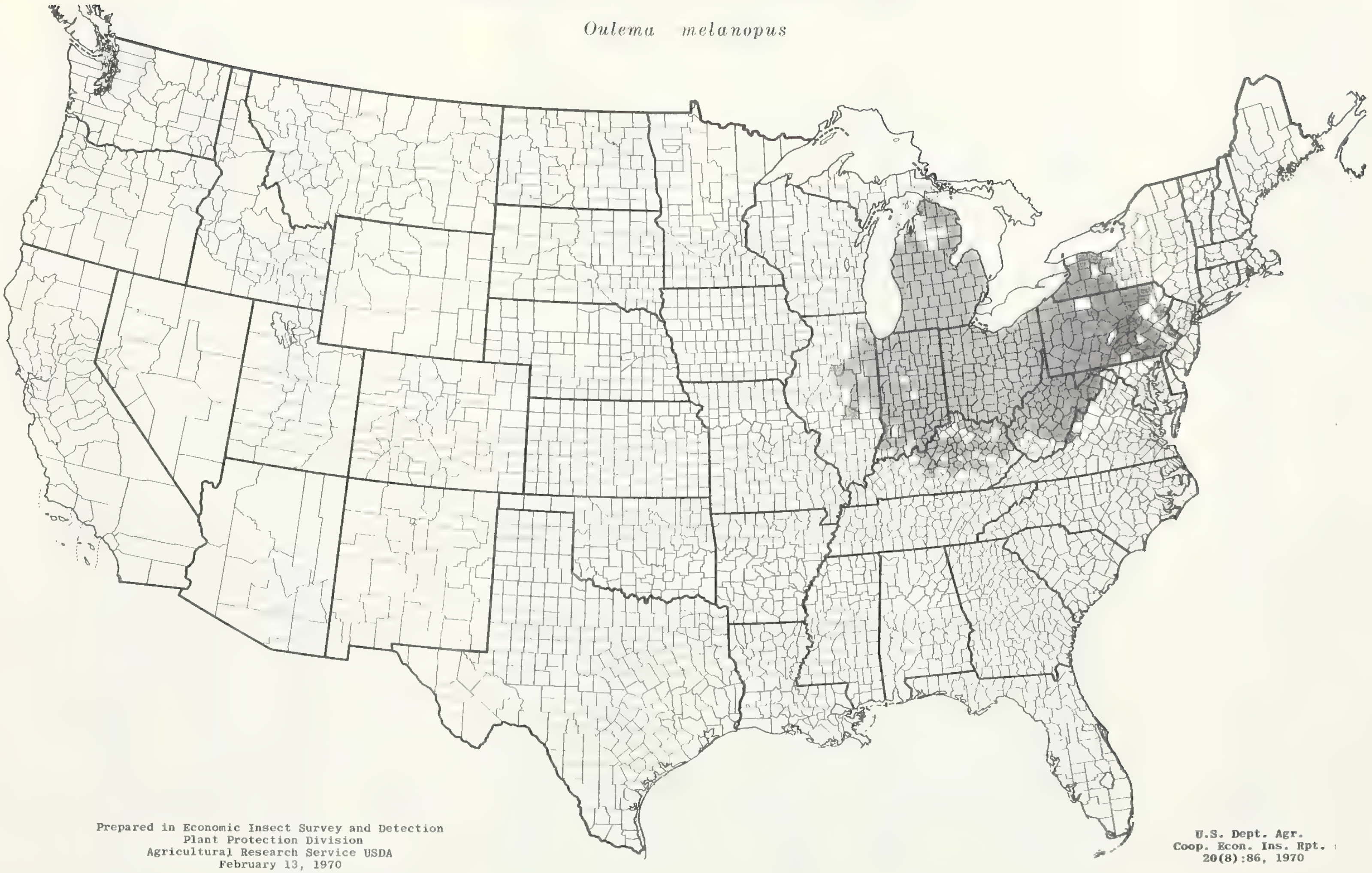
Survey was continued west of known infested fields on the Caprock. Survey work was continued in the trapping zone to gather data on populations. Significant extensions of infestations were found in northern Briscoe County, southeastern Floyd County, Crosby County, and western Garza County. By the end of September, an estimated 140,000 acres of cotton was found infested above the Caprock. Control operations were started September 2. An aggregate of 149,150 acres was treated on the first application, 115,000 acres on the second, and 208,000 acres on the third application. Because of the large increase in infested acreage, only the infested area above the Caprock was treated on the last three applications.

Detection traps for BOLL WEEVIL COMPLEX (Anthonomus grandis complex) were operated in NEW MEXICO, ARIZONA, and CALIFORNIA. New Mexico remains free of the boll weevil complex, while no significant numbers of the pest were collected in Arizona or California.

The BROWN-TAIL MOTH (Nygmia phaeorrhoea) survey was started during January and completed during May. Infestations were found as far east as Phippsburg, Sagadahoc County, MAINE. The following towns were found infested: Brunswick, Freeport, Falmouth, Harpswell, Portland City, and Yarmouth in Cumberland County. In Casco Bay, 21 of 26 islands surveyed were infested. Clipping of webs was done by State crews. A total of 80 townships in NEW HAMPSHIRE was surveyed, of which two were found infested. Infestations consisted of single webs--one in Henniker Township, Merrimack County, and three at sites in Moultonborough Township, Carroll County. State cooperators clipped webs at all known infestations. In MASSACHUSETTS over 75 gallons of winter webs found during the winter of 1968-1969 on generally infested park land in Provincetown and Truro were clipped and burned. Egg

Distribution of Cereal Leaf Beetle

Oulema melanopus



Prepared in Economic Insect Survey and Detection
Plant Protection Division
Agricultural Research Service USDA
February 13, 1970

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
20(8):86, 1970

deposition was reported from Provincetown, Barnstable County, on July 24. Detection surveys in the remainder of Massachusetts were negative and no extensions of the generally infested areas of Cape Cod were noted. Results of brown-tail moth survey in CONNECTICUT and RHODE ISLAND were negative.

CARIBBEAN FRUIT FLY (*Anastrepha suspensa*) was not found in any new counties of FLORIDA in 1969; trap catches are apparently leveling off or diminishing.

The eastward spread of CEREAL LEAF BEETLE (*Oulema melanopus*) during 1969 was phenominal. Infestations were found for the first time in 15 counties in INDIANA, 2 counties in OHIO, 34 counties in KENTUCKY, 41 counties in WEST VIRGINIA, and 36 in PENNSYLVANIA. Infestations were found in 10 western NEW YORK counties during 1969, 2 western MARYLAND counties, and 2 western VIRGINIA counties. The last three States represented new State records. Such spread caused a reassessment of quarantine measures. Westward movement of this pest was limited to two counties in ILLINOIS--McLean and Piatt.

In Ohio, populations were high enough to cause damage to oats and warrant control. This was the first report of damage during the 7 years the pest has been in the State. Treatment was applied in Illinois to over 57,000 acres. Parasites were released in Indiana and Ohio. Survey of 250,000+ acres for this pest was accomplished in 25 additional States not now known to be infested. Results were negative.

Over 30,000 trees were examined for CITRUS BLACKFLY (*Aleurocanthus woglumi*) in southern TEXAS. No citrus blackfly was found in the State, although a rather heavy infestation was discovered in Matamoros, Nuevo Leon, Mexico. Infestations were found at Nuevo Laredo and Reynosa, Mexico, also.

EUROPEAN CHAFER (*Amphimallon majalis*) was reported for the first time in RHODE ISLAND. An adult was taken in a light trap in Providence County June 25, 1969. This chafer was found for the first time in Middlesex County, CONNECTICUT; Hampden County, MASSACHUSETTS; and Fulton County, NEW YORK, during the year.

EUROPEAN CRANE FLY (*Tipula paludosa*) adults were collected in a light trap at Mt. Vernon, Skagit County, WASHINGTON, September 24. Adults were taken also in light traps in Whatcom County. Skagit County was a new county record.

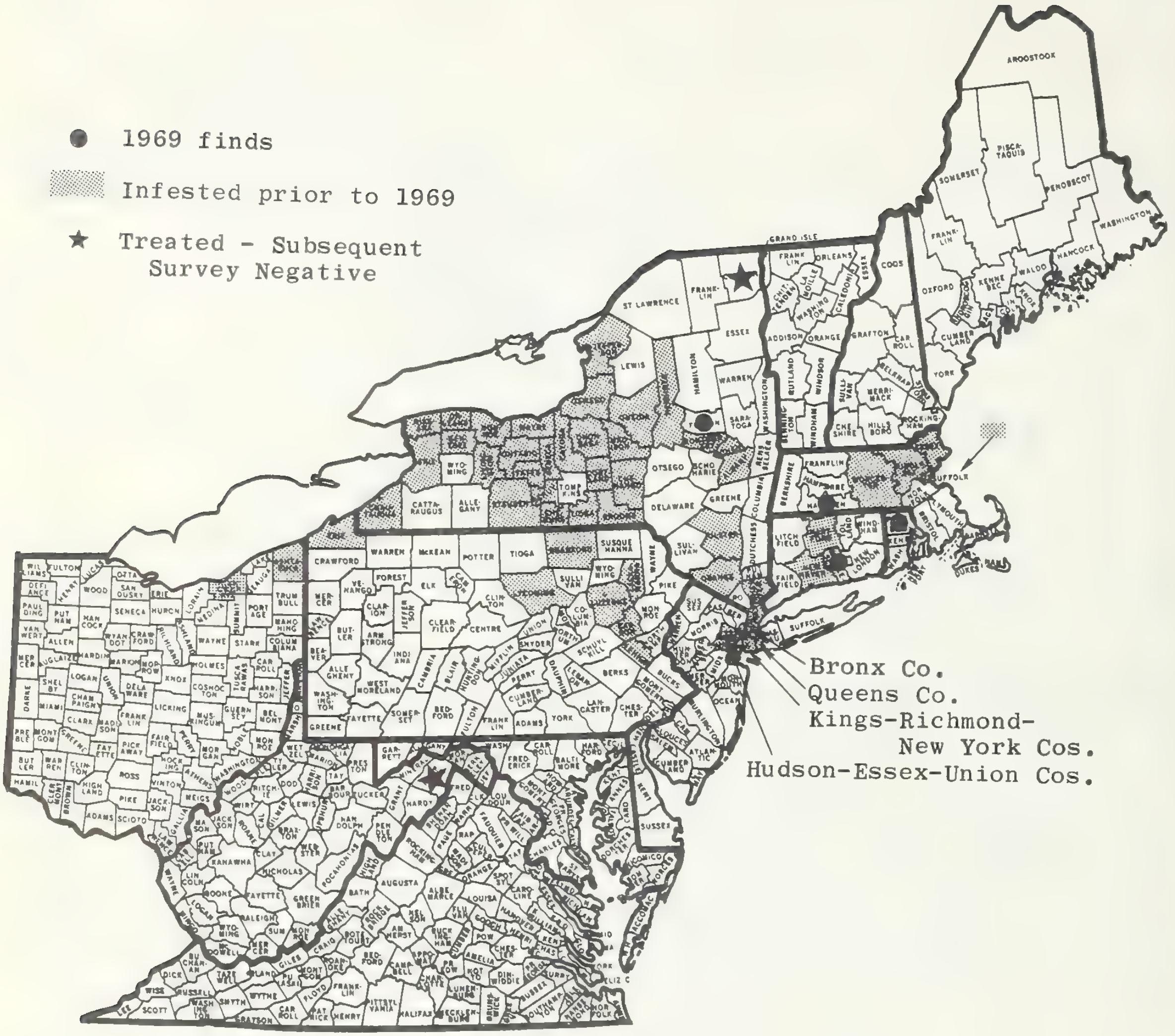
GIANT AFRICAN SNAIL (*Achatina fulica*) was discovered in North Miami, Dade County, FLORIDA, in September 1969. Additional snails were found later at Hollywood in southern Broward County. This was the first known established infestation of this pest in the continental United States. Eradication operations were begun immediately. By the end of 1969 the population had been drastically reduced.

Adults of a HELICID SNAIL (*Helix pomatia*) were collected in North Miami, FLORIDA, for a new State record. This snail is a potential pest of succulent plants, including vegetables. Control measures were undertaken to eradicate this pest from the State.

GOLDEN NEMATODE (*Heterodera rostochiensis*) was reported for the first time in DELAWARE on a potato farm near Middletown, New Castle County. This farm was fumigated in 1969. Following fumigation the farm was again sampled. No cysts were recovered. No additional infestations were found in Steuben County, NEW YORK. Fumigation of farms on Long Island is progressing.

GRASS BUGS caused noticeable damage on 35,000 acres of crested wheatgrass on the Hualapai Indian Reservation, ARIZONA, in June. In NEW MEXICO, controls were necessary on 4,000 acres of rangeland. *Labops hesperius*, *Irbisia pacifica*, *I. brachycera*, and *Irbisia* spp. caused substantial losses to range grasses in UTAH, but damage was less extensive than during the preceding 3 seasons. Damage was heaviest in Kane and Garfield Counties. In Kane County a rancher control program was conducted on private lands. *L. hesperius* damaged crested wheatgrass and adjacent borders of wheat in Goshen and Laramie Counties, WYOMING. Controls were effective.

Status of European Chafer - 1969



Prepared in Economic Insect Survey and Detection
Plant Protection Division
Agricultural Research Service USDA
February 20, 1970

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
20(8):88, 1970

Labops hesperius and *L. utahensis* infested roadside grasses in Latah County, IDAHO. Adults and nymphs had damaged crested wheatgrass by May 4 in Ada County. These pests had damaged about 50 percent of the crested wheatgrass and wild ryegrass in an area 15 miles wide and 30 miles long in Elmore County by May 21 when controls were justified. In late May, nymphs and adults severely damaged 2,000 acres of intermediate wheatgrass in Washington County. Native giant wild-rye in the East Slope area and intermediate wheatgrass in the Dixie area of Idaho County showed drying and yellowing due to these pests. *L. utahensis* severely damaged grass pasture in the Swan Valley area of Idaho, with controls required in early June. Grass bugs infested several thousand acres of grass pastureland in Clark County. *L. hesperius* damaged bromegrass, intermediate wheatgrass, pubescent wheatgrass, and orchard grass in Baker and Lane Counties, OREGON. Light colored foliage on 1,000 acres in Baker County and 400 acres in Lane County indicated much damage to these grasses. Most of the infested area has been in soil bank land for several years. *Irbisia pacifica* and other grass bugs damaged field borders of wheat near wheatgrass and other grassfields in several eastern WASHINGTON counties. These pests severely affected fields of timothy and alfalfa hay mixture in Kittitas County.

GRASSHOPPER populations in MINNESOTA showed some downward trend in 1969. Infestations were economic on 148,600 acres of forage crops, but damage was not apparent until late in the season when drought restricted plant growth. However, damage was not serious. *Melanoplus femurrubrum* was the dominant species. The outlook for 1970 is for moderate to abundant infestations in central Minnesota. Grasshoppers were noneconomic over most of NORTH DAKOTA due to unfavorable spring weather. Eggs hatched from mid-May through mid-July, with adults present by late July. Counts ranged up to 40 adults per square yard in alfalfa and soil bank fields, and marginal damage to small grains and soybeans occurred in several areas. Grasshopper egg hatch and development were delayed over most of eastern SOUTH DAKOTA due to an unusually cool, moist spring. Eggs first hatched in western and southwestern counties the last half of May. Hatch was light on rangeland in Fall River and Custer Counties during this period, but counts increased to 15-20 grasshoppers per square yard in fields, higher in margins, by late June. Counts were highest in several southeastern counties. Economic damage was limited to borders of corn adjacent to mowed alfalfa due to abundant vegetation in eastern South Dakota. Counts during the 1969 fall survey were highest in southeastern counties. Populations of *Melanoplus bivittatus* and *M. differentialis*, and in some areas *M. packardii*, increased compared with 1968. Infestations occurred mostly in alfalfa, but some flax was damaged. Grasshoppers are potentially economic over most of eastern South Dakota for 1970.

Grasshopper populations in NEBRASKA showed some increase over those of 1968. Heavy local populations damaged corn, sorghum, and soybeans in eastern, northeastern, southern, and southeastern sections of the State but were not economic on a wide area basis. These pests were mostly noneconomic in other sections of the State. The fall survey revealed some areas of infestation along the Platte River and along the Nebraska and South Dakota State line. In KANSAS, grasshopper adults in fall were heaviest in the northeast district, with heavy damage to border rows of corn, sorghum, and soybeans and to some alfalfa and clover. Counts were high at scattered locations in the north-central district. Grasshoppers are potentially the most serious problem in these 2 districts in 1970. Counts were heavy in a small area of rangeland but below economic levels in southwestern Kansas. Grasshoppers ranged very light to light elsewhere in the State. Egg hatch began in central OKLAHOMA in early April and continued through May in some areas. Fall surveys revealed 690,000 acres of rangeland were economically infested in 20 panhandle, northwestern, west-central, southwestern, and south-central counties.

Grasshoppers were serious on rangeland grasses on the Santa Clara and San Juan Pueblo Indian Reservations in NEW MEXICO, with treatments made in some areas. Infestations were also heavy on rangeland near Montoya, Quay County. Economic infestations were found on 923,000 rangeland acres in fall surveys. Grasshoppers were generally light in all rangeland areas of ARIZONA, with economic infestations found on only 28,000 acres during the fall survey. Grasshopper populations in UTAH were lower than normal in 1969. However, several species were damaging on about 50,000 acres of cropland, with treatments made on about 25 percent of this acreage. Of 378,860 acres of infested rangeland, 50,000 acres were treated by landowners.

In WYOMING, grasshopper adults were economic on 257,140 acres of rangeland during late summer; counts were highest in Converse, Hot Springs, and Johnson Counties. The fall survey showed small and scattered infestations on rangeland in Wyoming, due to cold, wet weather reducing populations during June. The 1969 fall survey in MONTANA revealed the lightest rangeland infestations since 1953. Some alfalfa fields in the western part of the State had 50+ grasshoppers per square yard however.

Surveys in southern IDAHO indicated 355,000 acres of rangeland were infested with 8 or more grasshoppers per square yard. Treatment was made on 14,256 acres along the south fork of the Boise River on the Boise National Forest in July. Controls were also applied to 28,896 acres on the Payette National Forest in Washington County. Grasshoppers averaged 8 or more per square yard on these rangeland areas in early September. Treatments were made on 13,000 acres in the area along the South Fork of the Payette River and on 44,000 acres south of Glenns Ferry. Rain reduced the effectiveness of controls at Glenns Ferry. Grasshoppers migrated from drying rangelands to many alfalfa, sweetclover, pea, and grain fields in northern Idaho in July. Counts ranged 8-15 per square yard in greener rangeland and along margins of peafields throughout Nez Perce County. Generally, counts remained high in the Clearwater area and there is a good possibility controls will be required in this area in 1970. The 1969 fall survey showed grasshopper infestations were economic on 1.77 million acres and light on 1.5 million acres in Idaho.

Grasshopper populations were generally at the same levels as in 1968 in NEVADA, with only small, localized acreages teated. Controls were applied to 3,500-4,000 acres of alfalfa and grain, and crop borders were baited in the Diamond Valley of Eureka County in June and July when Melanoplus sanguinipes ranged 40-90+ per square yard. Small, localized populations of M. rugglesi were observed in 2 areas in Pershing County and one area of Humboldt County during the same period. This is the first time this grasshopper has been seen in the field in Nevada for about 15 years. The fall adult survey in Nevada indicated potentially damaging infestations on 37,510 acres of rangeland and 12,370 acres of cropland in 1970. Grasshopper infestations increased throughout CALIFORNIA in 1969, but landowner control programs held populations below economic levels generally. Treatments were made on an 80-acre pine plantation to control Bradynotes obesa opima, a wingless species, which has become damaging in the Shinn Peak area of Lassen County. Controls were applied to 300 acres in the Hunter Liggett Reservation in Monterey County, as well as 200 acres on Shasta-Trinity National Forest and 500 acres at Doe Peak, both in Siskiyou County. Grasshoppers required controls on range, alfalfa, grain, and gardens in many northern California counties, where populations have increased steadily the past 3 years. Economic infestations in north-central California will bear watching in 1970.

Grasshoppers, mostly Melanoplus spp., infested scattered rangeland areas of OREGON during 1969. Counts averaged 15+ per square yard on 33,700 acres in Umatilla and Wallowa Counties during the fall adult survey. Grasshoppers averaged 10 per square yard in local areas of southwestern Oregon. Several species of grasshoppers severely damaged rangeland throughout eastern and central WASHINGTON, defoliating coniferous forest trees in some instances. These pests were heaviest in Klickitat and Stevens Counties, but were economic in 11 other counties in eastern Washington. Soil erosion may increase in some areas completely stripped by grasshoppers. The fall survey indicated grasshoppers were economic on 160,000 acres of rangeland in Washington.

GYPSY MOTH (Porthetria dispar) defoliated about 256,000 acres in 1969. NEW YORK led with 121,000 acres, while CONNECTICUT and NEW JERSEY followed with over 50,000 in each State. Defoliation occurred to a lesser degree in MAINE, NEW HAMPSHIRE, MASSACHUSETTS, RHODE ISLAND, and PENNSYLVANIA.

Gypsy moth was found for the first time in 3 States in 1969: Sussex County, DELAWARE; Cecil County, MARYLAND; and Albemarle County, VIRGINIA. New County records included New Castle County, Delaware; Hudson County, New Jersey; and Centre, Union, Snyder, Mifflin, Juniata, Perry, Adams, and York Counties, Pennsylvania. There was a general increase in gypsy moth populations in eastern Pennsylvania where infestations are building up in areas treated in 1965, 1966, and 1969. As many as 750 egg clusters per acre was not uncommon.

During the seasonal survey in New York, 59 positive sites were found in the suppressive and nonregulated areas of the State. Jefferson County was found reinfested this year, and trap catches were significant in northern Franklin County. Female moths were ovipositing as late as September 16 in Clinton County.

Several million *Ooencyrtus kuwanai*, an encyrtid wasp parasitic in gypsy moth eggs, were released at positive trap sites in Maryland, Delaware, New Jersey Pennsylvania, and New York. *Brachymeria intermedia* (a chalcid) and 3 tachina flies, *Exorista rossica*, *E. segregata*, and *Blepharipa scutellata*, as well as *O. kuwanai*, were released in these 5 States and in Massachusetts. Acres sprayed in 4 States were 321 in Connecticut, 27,105 in New Jersey, 20,207 in New York, and 400 in Pennsylvania.

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) was detected for the first time in Claiborne Parish, LOUISIANA. This pest is now known from every parish of the State. New county records include Flagler County, FLORIDA; Camden, Charlton, Appling, and Toombs Counties, GEORGIA; Georgetown and Williamsburg Counties, SOUTH CAROLINA; Shelby, Madison, and Lavaca Counties, TEXAS.

Extensions of existing infestations were found in 14 counties in Georgia, 3 parishes in Louisiana, 10 counties in MISSISSIPPI, 6 counties in NORTH CAROLINA, 3 counties in ALABAMA, 8 counties in South Carolina, 12 counties in Texas, and 7 counties in Florida. Some spread was noted in Union County, ARKANSAS. Eradicative treatments were made on over 7 million acres in Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas. All surveys in TENNESSEE were negative in 1969.

JAPANESE BEETLE (*Popillia japonica*) traps were placed in nonregulated areas of MAINE where previous infestations had been detected. No infestation was found in the State. Traps were removed in September. Japanese beetle was found in Lee County, VIRGINIA, the only county in which the insect had not been found previously. At Dover Air Force Base, DELAWARE, adults were so numerous that treatment of planes was necessary. The base was declared nonhazardous on August 19.

Survey in ALABAMA resulted in again finding beetles in Jefferson and Lee Counties. Established infestations were found in GEORGIA in Barrow, Clarke, Fayette, Jackson, Madison, Oconee, and Walton Counties, and the remainder of Gwinnett County was found infested. New infestations and extensions totaled 419,000 acres. In TENNESSEE the first adults of the season were taken on June 12 in Monroe County. Adults were trapped in Campbell, Carter, Claiborne, Loudon, Hamilton, Greene, Hawkins, Montgomery, Polk, Sevier, Unicoi, Washington, Madison, and Anderson Counties. The cities of Loudon and Lenoir City are becoming reinfested.

An increase in the number of beetles and new finds over last season was indicated in the East St. Louis and Chicago areas, as well as at Moline and Vandalia, ILLINOIS. A nursery in St. Joseph County, INDIANA, was found infested. An extension of the Paducah, KENTUCKY, infestation was found. Beetles also were trapped in Clay, Gallatin, and Oldham Counties. An estimated 190 acres is known to be infested. No Japanese beetles were found on the Kentucky side of Ft. Campbell.

Japanese beetles were found in Detroit, Warren, and in Berrien County, MICHIGAN, where treatments were made in 1968. On July 16 at the Marywood Golf Course north of Battle Creek, Japanese beetles were observed "balling" as they emerged on Fairway Number 9. This area was treated 3 years ago. Single beetles were found in Marshall, Flint, Ypsilanti, at the Erie Truck Scales in Monroe County, and at

Edwardsburg in Cass County. In MISSOURI the only beetles found were at St. Louis where 24 were trapped at 21 sites. Heavy infestations of Japanese beetles were reported in Butler County. Light to moderate infestations were noted on border areas of corn and soybeans; however, some damage was done to these crops. Survey for this pest in 18 uninfested States was negative.

MEXICAN BEAN BEETLE (Epilachna varivestis) was found infesting bean plants in more than 350 gardens at Boise, Ada County, and 50 gardens at Rupert, Minidoka County, IDAHO, during May and June. Eradicative treatments were made.

During the MEXICAN FRUIT FLY (Anastrepha ludens) trapping period of March and early April, 63 flies were found on 42 properties in Cameron, Willacy, Hidalgo, Starr, Zapata, and Dimmit Counties, TEXAS. The single fly trapped in Zapata represents a new county record. Larvae were found in grapefruit in 3 groves in Hidalgo County on April 16, 17, and 23. Inspection of oranges was negative. Trapping was conducted in FLORIDA, LOUISIANA, ARIZONA, and CALIFORNIA, but no A. ludens flies were found in these States. Nine native flies were trapped in Tijuana, Mexico, but no native flies were recovered in Ensenada, Tecate, or La Paz. Sterile flies are released for control purposes in Baja California, Mexico.

MORMON CRICKET (Anabrus simplex) was insignificant in all former problem areas of UTAH, OREGON, IDAHO, MONTANA, and WYOMING. No control was necessary and no banding was observed. Crickets began to build up in areas of Eureka and Pershing Counties, NEVADA, mainly the latter county, where bait was applied to 1,054 acres to protect 10,000 acres in the Humboldt Range. Summer adult surveys in the northern section of the State indicate an increase in several areas with a history of heavy infestations. Current infestations involve 2,700 acres in Eureka County, 4,000 acres in Lander County, and 20,000 acres in Pershing County. Specimens observed in other areas were generally scattered and in the solitary phase.

Eighteen ORIENTAL FRUIT FLY (Dacus dorsalis) adults were trapped at 16 locations in El Monte, Los Angeles County, CALIFORNIA, during September. Intensive trapping and treatment continued into 1970. No larval infestations were found. A single male oriental fruit fly was found in a Steiner trap at Golden Beach in Dade County, FLORIDA, December 3, 1969. Density of traps was increased and fruits were inspected. No additional flies were trapped, and no larvae were found.

The first PINK BOLLWORM (Pectinophora gossypiella) moth catch of 1969 in CALIFORNIA was March 7 at Borrego Springs. Traps were baited with hexalure in all areas of operation. Larvae built up to alarming proportions in the Coachella Valley where release of sterile moths failed to control the infestation. In Kern County, 5 moths were trapped during the 1969 season, but no larvae were found. No moths or larvae were found in this area of California in 1968. In ARIZONA, pink bollworm moths were caught in sex lure traps and larvae were found in lint cleaners during January. By June, larvae infested 25 percent of cotton blooms in western and central Arizona. Pink bollworm larvae built up in cotton fields in NEW MEXICO in Chaves, Eddy, and Dona Ana Counties, but infestations were light in Luna, Hidalgo, and Grant Counties.

Pink bollworm larvae were recovered from debris in several counties of TEXAS. Limited bloom inspection in Hidalgo County revealed 10-30 larvae per acre in a few fields in April. Bloom inspections in most cotton-producing counties of southeastern Texas indicated a generally light infestation. The first pink bollworm of the season in LOUISIANA was found in Rapides Parish in early December.

PISTACHIO SEED CHALCID (Megastigmus pistaciae) surveys were conducted in Alameda, Amador, Butte, Colusa, Contra Costa, Fresno, Glenn, Lake, Madera, Orange, San Diego, San Joaquin, Stanislaus, Sutter, and Tulare Counties, CALIFORNIA. Sticky board traps were used extensively, beginning in March. No emergence was noted until June 3 in emergence cages in the Plant Introduction Station. The first adult was trapped June 16. More than 70 adults emerged from Pistacia chinensis seed for a new host record. By July, M. pistaciae was emerging from P. chinensis trees as far as 0.5 mile from Plant Introduction Station grounds. By August, M. pistaciae was found at sites up to 4 miles from the Plant Introduction Station; however, all were in Chico, Butte County. At least 15 confirmed infestations are known within the city limits of Chico. Late in the year 4 infestations were confirmed in Orange County near Irvine, and 4 were confirmed from San Diego County in the cities of San Luis Rey, Oak Grove, and Santa Ysabel.

RANGE CATERPILLAR (*Hemileuca oliviae*) surveys were made in Colfax, Union, Harding, Mora, and Lincoln Counties, NEW MEXICO. Heavy infestations were found on 500,000 acres in Colfax County near Chico and Farley. Approximately 500,000 acres of medium infestations exist in other areas along the Colfax, Union, and Harding County lines. Spot infestations were found outside this generally infested area from Folsom to Cimarron on the west, Clayton on the east, and Watrous on the south. Most of these areas had very few range caterpillars in 1968.

Surveys for SOYBEAN CYST NEMATODE (*Heterodera glycines*) were conducted in 28 States. Local spread was reported from several counties in infested States. The following counties or parishes were reported infested for the first time in 1969: White and Yell, ARKANSAS; Okaloosa, FLORIDA; Union, KENTUCKY; Madison and Morehouse, LOUISIANA; Adams, Alcorn, Holmes, Lee, Prentiss, Sunflower, Union, and Wilkinson, MISSISSIPPI; Hyde, NORTH CAROLINA; and Accomack, VIRGINIA. Crop damage was heavy in Beaufort and Hyde Counties, North Carolina, and in the Elizabeth City area. One field of Pickett variety soybeans was found infested in TENNESSEE, with some damage evident. In the Bootheel area of MISSOURI, some varieties of soybeans are no longer resistant to a new biotype of soybean cyst nematode.

SWEETPOTATO WEEVIL (*Cylas formicarius elegantulus*) infested 5 new properties in ALABAMA, 2 in GEORGIA, 8 in LOUISIANA, and 8 in MISSISSIPPI. Lure traps baited with virgin female weevils proved effective as a survey tool in Louisiana. The police jury of Franklin Parish passed an ordinance prohibiting the planting of sweetpotatoes within one mile of the experiment station at Chase where foundation stock is grown. Seed beds in Franklin and Natchitoches Parishes, Louisiana, were found infested, as was one storage house in Allen Parish. Adults were found in a storage house at Whiteville, NORTH CAROLINA, but no larvae were found in sweetpotatoes. A Tabor City storage house was found reinfested.

No live forms of WESTERN GRAPE LEAF SKELETONIZER (*Harrisina brillians*) were found during 1969 in Sacramento, Yolo, Kings, Placer, or El Dorado Counties, CALIFORNIA. A single moth was taken early in spring at Clovis, Fresno County. Eradicative treatments and inspection continued.

WEST INDIAN SUGARCANE ROOT BORER (*Diaprepes abbreviatus*) adult emergence in FLORIDA began in April, and by the end of the month numerous adults could be found. The infestation is still confined to the Apopka area of Orange and Marion Counties. Surveys were conducted in areas of Citrus, Charlotte, Collier, Palm Beach, Putnam, Alachua, Seminole, Broward, Dade, Lee, Glades, Lake, and Hendry Counties in addition to the area infested. Survey was negative in all but the known infested area.

WHITE-FRINGED BEETLES (*Graphognathus* spp.) were found for the first time at Fort Belvoir in Fairfax County, the city of Alexandria, and in Halifax County, VIRGINIA. In Halifax County, larvae destroyed 25-35 percent of the tobacco in 4 fields on a farm in August. In other areas of the State some spread was noted. Other new county or parish records included Jackson, ARKANSAS; Cook and Mitchell, GEORGIA; Bossier, Webster, and St. Martin, LOUISIANA; Noxubee, MISSISSIPPI; and Knox and Lewis, TENNESSEE. Survey in the infested Bootheel area of MISSOURI revealed no spread during the year, nor was any spread found in TEXAS or MARYLAND. White-fringed beetles damaged many isolated peanut fields in southeastern ALABAMA and most of a 40-acre planting of watermelons in Washington County, FLORIDA. These pests damaged tobacco in Cook County, Georgia. Local spread occurred in many infested counties of Alabama, Florida, KENTUCKY, NORTH CAROLINA, and SOUTH CAROLINA. Surveys were conducted in the noninfested States of OKLAHOMA, NEW JERSEY, ILLINOIS, OHIO, and PENNSYLVANIA, with negative results.

WOOLLY WHITEFLY (Aleurothrixus floccosus) eradicative treatments continued in CALIFORNIA. This pest is still present in the infested area at San Diego, San Diego County.

Bait treatment for WHITE GARDEN SNAIL (Theba pisana) continued in CALIFORNIA during the time snails are not in estivation. Live snails were recorded from one property at Manhattan Beach, Los Angeles County, in 1969.

Weather of the week continued from page 80.

TEMPERATURE: Mild weather continued over most of the western half of the Nation last week making it the fifth consecutive week with warmer-than-normal temperatures. A large area from central Idaho to northern Arizona and from southeastern Oregon to central Colorado averaged 9° to 13° above normal. Storms brought changeable weather to the central and eastern sections of the country which averaged cooler than normal. The eastern section of the northern and central Great Plains and eastward to the Ohio River Valley averaged 3° to 7° below normal. Above normal averages occurred in eastern New England. Near the Great Lakes where the week began with a few mild days, the weather turned sharply colder followed by slight warming over the weekend. The Deep South was mostly cool at the beginning and end of the week with milder weather at midweek. Freezing weather reached the gulf on Tuesday morning and scattered frosts occurred in northern and central Florida. An arctic blast late in the week brought subzero temperatures to the North Central States and parts of the Northeast. Moline, Illinois, registered 7° below zero on Friday morning. (Summary supplied by Environmental Data Service ESSA.)

The Armyworm Situation in the U.S. - 1969

Serious outbreaks of armyworm (Pseudaletia unipuncta (Haworth)) were reported in the Midwest during summer 1969. 1/ Preliminary reports indicated developing problems in northern and eastern Nebraska, western Iowa, southern Minnesota, eastern South Dakota, and in parts of North Dakota. Outbreaks were also reported in central and eastern Kansas, northern Missouri, and northern Illinois. Less serious infestations occurred in Ohio, Indiana, Michigan, Wisconsin, Oklahoma, Colorado, and Wyoming.

Two complete broods and a partial third brood of armyworm developed in Nebraska in 1969. First-brood larvae appeared in late May and were active into early July. Second-brood larvae appeared about July 15 and damage subsided by mid-August. The few third-brood larvae that appeared in September were negligible in most instances. Damage was first reported in Iowa the week of June 9 from counties along the Missouri River, first in Fremont County and extending northward through Monona County. Activity had decreased by June 21. Adult activity peaked in the southern area the week ending July 1 and in the northern area about July 15. Second-generation larvae were active across southern Iowa during the week of July 7, the central area by July 14, and the northern part of the State by July 21. First heavy populations in Minnesota occurred in Rock County July 21. The first infestation in South Dakota was reported from Turner County July 19, and in North Dakota July 30 in the southwestern area.

The armyworm outbreak in Kansas was first reported in early June in Sumner and Cowley Counties, and in Missouri infestations were economic in areas throughout the northern half of the State by mid-June. The first indication of a potential problem in Illinois was observed the week ending July 14 and in Indiana the week ending July 20. Damage was first reported July 20 in Illinois and July 27 in Indiana. There were a few local outbreaks of armyworm in Ohio, but fall armyworm (Spodoptera frugiperda) was heavier throughout the State and infested a much larger acreage than armyworm. The first armyworm problem was reported August 5. In Michigan, field damage to corn first occurred about mid-July, and a potential for problems in Wisconsin was first apparent by July 11.

First reports of armyworm damage in Oklahoma were received the week ending May 30 from central, southwestern, and north-central areas. The problem in Colorado was first noted the last week of July in Boulder, Larimer, and Weld Counties. Armyworm was of minor concern in Wyoming, first being reported near Douglas, Converse County, July 29.

First-generation armyworm infestations in Nebraska were spotty and concentrated in bromegrass, where counts occasionally ranged 10-20 per square foot. Larvae ranged 1-6 per square foot in wheat, but most infestations were noneconomic. Migration to adjacent corn and sorghum began the second week of June. First-brood larvae were heaviest in the southeast and eastern crop districts. Populations were economic on 120,000 acres in Nebraska. Second-brood larvae damaged oats, corn, sorghum, and alfalfa, and caused much concern on lawns in urban areas. Damage was most serious in the central, northern, eastern, and northeastern districts, with a few heavy infestations reported in the northwest district. Larvae also occurred in a few southeastern counties. Second-brood larvae were economic on 85,000 acres in Nebraska. Infestations in Iowa were heaviest in the area north of U.S. High 20 and west of U.S. High 169. Armyworm infested an estimated 1,200,000 acres of oats for grain, oats in diverted acres, and bromegrass pastures. Larvae were also a problem in many lawns.

1/ A questionnaire was submitted to cooperators in 15 States in an attempt to gather information on these outbreaks. This report is based on the responses from these States.

In Minnesota, small grains, primarily oats, were most seriously damaged, but corn, soybeans, alfalfa, reed canary grass, peas, and sorghum were infested. Armyworm was also a problem on bluegrass lawns. Larvae were economic in 37 counties in the south-central, central, and southeast districts, with highest counts in Rock, Nobles, Pipestone, and Murray Counties. Larvae were found as far north as Norman County, but numbers were economic primarily in the southern half of the State. The outbreak ended by August 15 although larvae still could be found in some fields. Armyworm infested or threatened an estimated 900,000 acres of oats, barley, corn, and flax in South Dakota. There were no extensive outbreaks in North Dakota. Infestations up to 40 larvae per square foot appeared July 30 in the southwestern area where hail severely damaged crops July 7. A few larvae were detected in many fields throughout the State, but infestations were noneconomic.

Within 10 days of the first report of an outbreak in Kansas, armyworm was economic in most counties in the central, south-central, southeast, east-central, and northeast districts. Severest infestations in wheat were found in the southeast, south-central, central, and east-central districts, and in bromegrass in the east-central and northeast districts. Movement to row crops was reported but little damage occurred. The outbreak had subsided in most areas by the end of June. Larvae were light in most crops and in most areas of Kansas throughout summer, but no economic infestations were observed or reported. Larvae ranged 1-4 per square foot in small grains in southeastern Missouri from early to mid-May. In early June, larvae averaged 5 per square foot in dense wheat and bromegrass in the central area, and by mid-June, infestations were economic in areas throughout the northern half of the State. Larvae ranged up to 40 per square foot in bromegrass pastures the first half of June in the northwest area. Several pastures were completely stripped in Atchison, Nodaway, and Holt Counties. Moth flights were heavy throughout July, with peak numbers recorded from blacklight traps in early August in Platte and Greene Counties. The outbreak in Illinois was due to second-generation larvae which is not typical in the State. Very heavy moth flights during July indicated the potential problem in the northern half of the State. Infestations involved corn, oats, and government acreages.

The armyworm outbreak in Indiana was unusual in that it also involved second-generation larvae. All crop damage was to about 2,000 acres of corn which had already set ears. The outbreak in Ohio was not of major importance and apparently only involved corn. The infestation in Michigan was scattered through most of the State. Corn was the principal crop infested, but a few late crops were involved. Corn damage appeared about mid-July and ended about mid-August. A potential problem was apparent in Wisconsin by August 1. Larvae were first noted in grass field margins in Columbia County. Infestations were too late to affect much pea acreage. Oats and corn were the principal crops affected. Close examination showed that most infestations were fall armyworm. The problem had abated by August 22.

Armyworm outbreaks in Oklahoma were limited in many parts of the State. Small grains, particularly wheat, were infested most frequently, but larvae were common in native grasses also. Infestations were reported throughout the western half of the State except in the panhandle area. Populations were variable from field to field, and damage was serious in about 10,000 acres. Damage was light to moderate in most fields in western Oklahoma, and outbreaks seldom lasted more than 2 weeks.

Populations were heavier than usual in Colorado, and were economic in grasses, corn, sorghum, alfalfa, and lawns. Armyworm was found throughout the eastern part of the State, but economic infestations were scattered and in many instances not reported. Infestations lasted from late July through August, with most damage occurring the first 3 weeks of August. Armyworm was very scattered in Wyoming, mainly in oats or hail-damaged grain. There was some movement to corn and alfalfa after grain began to dry.

Apparently there were no indications in 1968 that an armyworm outbreak would occur in 1969. A minor outbreak did occur in 4 west-central counties of Minnesota in 1968, and overwintering larvae and pupae were found a few times in Oklahoma, but no outbreaks were predicted. First indications of possible outbreaks in 1969 were heavy moth flights and light trap collections earlier in the season. Crop conditions were ideal for egg laying in many areas, and weather was favorable for larval survival. Cool, wet weather in spring and a large amount of lodged wheat in many areas in May and June were major factors contributing to the severe outbreak in Kansas. These conditions also favored outbreaks in other States. Grass and weeds in some cornfields also provided excellent egg-laying sites. Wide dispersal of adults, due to southerly winds in some areas, also contributed to extensive infestations.

Parasites and predators had very little effect on outbreaks in most areas. Parasites, particularly Winthemia quadripustulata (a tachina fly) and Apanteles militaris (a braconid) are credited with the curtailment of a second generation of armyworm in Wisconsin. Beneficial species had little effect in preventing damage by the second generation in Illinois, but did help prevent another generation from occurring. Parasites eventually reduced populations in Indiana.

According to the contributors to this report, there is very little, if any data available for predicting the armyworm situation for 1970. There is no history of 2 successive years of outbreak in Iowa or Indiana. Outbreaks in northern areas depend upon moth flights from southern areas. Much depends on whether wet weather and good growing conditions occur in the spring of 1970.

Armyworm infested an estimated 3,656,000 acres of small grains, corn, pasture grasses, and some legumes in those States where outbreaks occurred. Approximately 1,113,000 infested acres were treated. The average cost of control per acre ranged from $1.50 to $4.80 and averaged $2.70. The estimated loss to crops due to armyworm infestations in 1969 was in excess of $7,000,000 with Nebraska, Iowa, Minnesota, South Dakota, Illinois, and Oklahoma reporting the most damage.

See table on page 98.

THE ARMYWORM SITUATION IN THE U.S. - 1969

State	Crop	Estimated Acres Treated	Control Cost Per Acre (Dollars)	Estimated Crop Loss (Dollars)
Colorado	Grasses, corn, sorghum, alfalfa	Not available	Not available	Not available
Illinois	Corn, oats, government acres	250,000	2.50-3.50	750,000-1,000,000
Indiana	Corn	1,700	4.80	Insignificant
Iowa	Bromegrass, oats, corn, alfalfa, some soybeans	293,550	2.75-3.50	1,320,000
Kansas	Wheat, bromegrass	75,000	2.50	Not available
Michigan	Corn, oats	2,000	2.80-2.90	Not available
Minnesota	Small grain, corn, legumes, soybeans, other crops	87,746	1.50	1,372,075
Missouri	Pastures	12,000	Undetermined	Not available
Nebraska	Wheat, oats, bromegrass; some corn, sorghum, alfalfa	177,700	2.50	933,000
North Dakota	Oats, barley, wheat, durum, corn	10,000	1.25-1.50	150,000
Ohio	Corn	Unknown	3.00-4.00	Could not be separated from fall armyworm damage
Oklahoma	Small grains	10,000-15,000	2.20	440,000
South Dakota	Oats, barley, corn, flax	416,000	2.00-3.00	2,220,000*
Wisconsin	Corn, oats, peas	25,000	2.00-2.50	38,000
Wyoming	Oats, corn, alfalfa	200	Not available	Insignificant

* Includes cost of spray treatments.

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
20(8):95-98, 1970

UNITED STATES DEPARTMENT OF AGRICULTURE
Hyattsville, Maryland 20782

OFFICIAL BUSINESS

POSTAGE & FEES PAID
United States Department of Agriculture